

The New Science: *Implications for Advancing Initiatives*

By Nicanor Perlas

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The Evolution of Science

1. I will share with you some of the developments of the new science and the implications for taking initiative. This is timely, since we are in an academic setting, and because what is going on out there, abroad, or in the mainstream is pretty amazing. As a scientific institution it be would be good for you to catch up a little bit on the new science developments.
2. But first we look at the origins of the university. The “university” started over 2000 years ago in Greece, in the academy of Plato, the Lyceum of Aristotle, which then became the basis of the universities of the Middle Ages. The university concept first emerged out of Europe then got exported to the US... then brought here (just in the last few decades) in the universities. **Now we have what is called the university system.** One of the main aspects connected to the university system is the whole process of knowledge. Such knowledge can actually transform the foundation of who we are, and to what we can do to shape the world.
3. The science that we are normally being introduced to in the academe becomes a very important part of our formal education. Unfortunately, some of the assumptions of a lot of scientific research are stuck in the 19th century. While science has actually moved on quite a bit; there are a lot of amazing discoveries in many different fields of science. In this talk I will give some examples of some of these discoveries, then try to create a picture of what these discoveries mean to us as humans, for society, as well as to where the world is going. Then I shall subset that into a kind of practical mode, to answer the question: *given the new science **what does it mean if we want to start an initiative ?***
4. Physics has the reputation of being one of the hardest subjects because of the empirical basis (or requirements) and all the mathematics involved.

Physics had gone into basically **two revolutions in the 20th century, after Newtonian physics**. The first is that of Einstein, while the second one is rapidly transforming our notion of the world and of who we are as human beings.

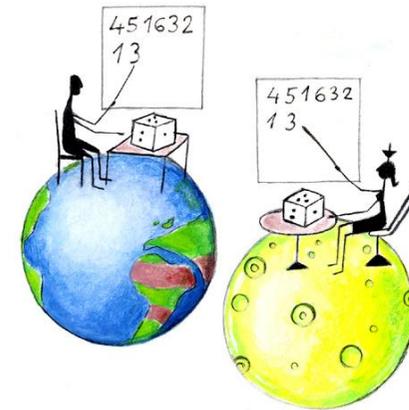
5. The first post Newtonian scientific revolution is Einstein's theory or the **Theory of Relativity**. Then came **Quantum Physics (QP)** or **Quantum Mechanics (QM)** which, as a paradigm or framework of science, was formulated after many different inner debates in the scientific community in 1925 (*QM was already there a long time ago*). By the way, we are so happy with our cellphones and internet, etc., but none of these could operate without QP. In fact, the scientific community considered QP to be the "most successful" scientific theory in history, even more successful than Newtonian physics. It is actually a kind of a hard science.
6. But then **in 1982 some of the more radical implications of QP became empirical fact**. This is what I want to drive on here because after 1982 there was a series of intense evolution of a specific idea, until finally a point that it was already starting to affect **astrophysics**, or the physics of the universe.
7. So the year 1982 was when there was the most important discovery in QP (*I learned about this when I had to go to the US that year to oppose the opening of the BNPP or Bataan Nuclear Power Plant, which*

unfortunately is being revived today basically out of ignorance about the safety defects). That year there was a team of scientists that gave empirical evidence for a concept that is very difficult to understand in terms of ordinary thinking, but is actually the basis of so many other scientific developments, and also of technology. This very discovery, which is connected with astrophysics, is being used in the design of a **super computer** by the US Department of Defense which has extraordinary nature (*will comment on this later*)....

8. What is this major discovery in 1982 which gave QM a kind of an empirical grounding even beyond the churches of Einstein? (*Einstein, by the way didn't like QM, particularly this kind of discovery that was empirically verified in 1982, and then since that time had been consistently verified not only at the level of tiny particle, but even at the level of whole organism, and even of societies, and of the true nature of the universe itself*). It is the notion of **Non-locality (NL)**, which seems to be a very simple word but with profound implication. This is a kind of "cause and effect" that is not like that cause of effect under the ordinary Newtonian mechanics or that kind of cause and effect in the study of Genetic Engineering and biology.
9. The cause and effect of non-locality refers to this: *if two particles are related in the beginning and are*

separated billions of miles away, there will be a kind of instantaneous communication between the 2 particles; they mutually influence each other. This is a shocking discovery and Einstein disliked this. For Einstein, this concept is a kind of voodoo... because it is about action at a distance (very far away). **There is instantaneous response/communication.**

10. The other reason why Einstein did not like NL concept is that it seems to violate his speed of light (in his equation $E=mc^2$). His speed of light is only 186,000mps (*very fast but not fast enough to affect instantaneously...*). Based on Einstein's own equation one could conclude that if something is travelling faster than light (or is essentially instantaneous), then people will have weird access to the future and the past. This communication brings out all kinds of riddles and puzzles, which the ordinary mind cannot grapple with. But this has been the stuff of science fiction movies for a long time now.



<http://www.google.com.ph/imgres?hl=fil&sa=X&biw=1241&bih=606&tbn=isch&prmd=imvns&tbnid=nh68e3emNlxhfm&imgrefurl=http://www.phy.bris.ac.uk/groups/theory/index.html&docid=qQC5iPamo1xEdM&imgurl=http://www.phy.bris.ac.uk/groups/theory/images/alice-and-bob.jpg&w=480&h=467&ei=mRQeUMi0PMuhiQefuYHQ&zoom=1&iact=hc&vpx=107&vpy=267&dur=837&hovh=221&hovw=229&tx=142&ty=101&sig=107096551466351784350&page=1&tbnh=123&tbnw=121&start=0&ndsp=21&ved=1t:429,r:7,s:0,i:91>

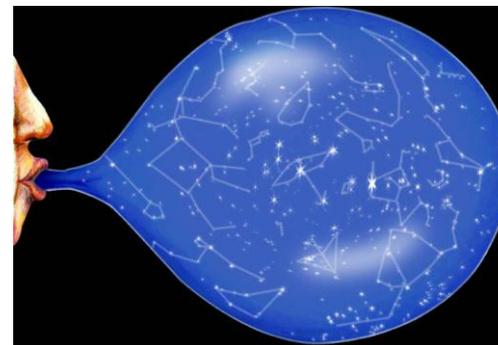
10. This Non-locality has actually not been debunked up to this time. On the other hand, all studies have repeatedly verified it, in very different areas, content fields, writings, etc... So NL is a mainstream aspect of the modern scientific revolution which I call **the second scientific revolution**. We at the Center for Alternative Development Initiatives (CADI) are taking a look at how this second wave of the conceptualization and discovery may be brought to a new framework of understanding of who we are and of other aspects of the universe. *There are yet other aspects of QP but I will not deal with them here... I want to touch on other disciplines to create a broad picture.*

11. From Einstein we go to quantum... still in the field of Astrophysics. The science of QM or QP is about the study of subatomic particles... which by the way is not only about electrons, protons and neutrons, or of sub atomic particles, up to what is considered final level of particles or the quarks. *Note that Einstein's notion is already very different from conventional science with respect to energy-matter transformations. But there is more beyond Einstein's concepts.*
12. Another discovery in QP-Astrophysics is the **“quantum vacuum”** or **“zero point energy”** (ZPE): The notion of a vacuum is this: when we try to remove as much particles as possible in a space (or we empty out a space of all particles), we approach or reach zero energy... what scientists did was to freeze something at absolute zero or with a very low freezing point of $-273\text{ }^{\circ}\text{K}$ (*absolute zero, the temperature at which all thermal motion ceases in the classical description of thermodynamics*). It was found that **in this ZPE level of the quantum field, or of that vacuum state**, (which is the basis of the whole quantum phenomena)... **the energy contained in an object like the podium here is greater than all the hydrogen fusion in all the trillion of stars in the universe!** This is a very powerful source of energy. There are in fact researches now going on in the Department of Energy, in the Department of Defense in the US, trying to tap into this ZPE... these interest because of the verification of the existence of this energy. So in QP it was discovered that beyond the vacuum or in “empty space”, the **whole physical universe is actually supported by a massive amount of energy**, that we have no idea how much or what it really is ... The discovery of such space led to the discovery of NL.
13. These many scientific discoveries, when taken together and linked together, can give us an amazing picture of a very different world, or of the world we are inhabiting. **The knowledge here has massive implications for agriculture, health, environment, life and even in redesigning societies.**
14. In Astrophysics indeed resides one of the hottest fields of discoveries. In the last 20 years, there have been a number of revolutions in instrumentation; a number of measurements and actual studies. One of the most important of these is the **Hubble space telescope**, which was discovered in the 1990s. This telescope can get very beautiful pictures and enables us to see the beauty of space. Anyone of you here are familiar with Google view? Find UPLB in “Google view” (from the “Google earth” window). If you change the view and go to “Google sky”, you will see the sky as it looks in UPLB on a specific day. There also you will see a picture of nebulae, etc. What you see there are actual photographs (not drawings) of tens of thousands of stellar bodies; these have become the basis of a lot of research.

Mathematics precedes proof of the Big Bang and other space concepts

15. What is amazing about the whole thing is that **a lot of the original discoveries in the field of astrophysics were first achieved through mathematics.** This is done first through getting some data, then constructing a mathematical model of the universe ... There have been a lot of different views about the universe. The current one, which is the mainstream, was in fact verified and accepted 2 years ago. A Nobel Peace Prize scientist gave the beginnings of the empirical basis for the model of the universe, i.e., the **Big Bang theory.** This is about the way the Universe came into motion and the way it actually unfolded, and this has led to lot of scientific controversies because of the discovery.
16. The Big Bang says that we started from a mathematically infinitely small point. In geometry we know that this point actually does not exist physically but in mathematical formula. Yet from this infinitely small unit arose a massive universe which takes physical light over 12B light years to travel.
17. The Big Bang concept also changed the notion of "space" (or our ordinary and Einstein's concept of space). Space is no longer the same as that which we know in ordinary physics, like the space taken by this podium and chairs here in the room. In Astrophysics, it is **revealed that the size of space of the universe is**

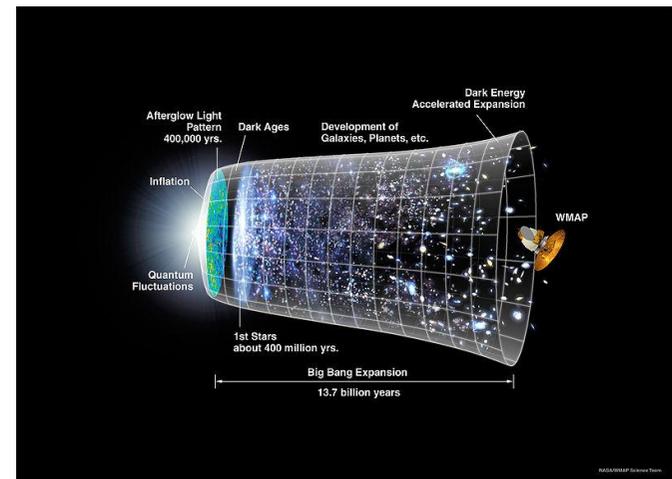
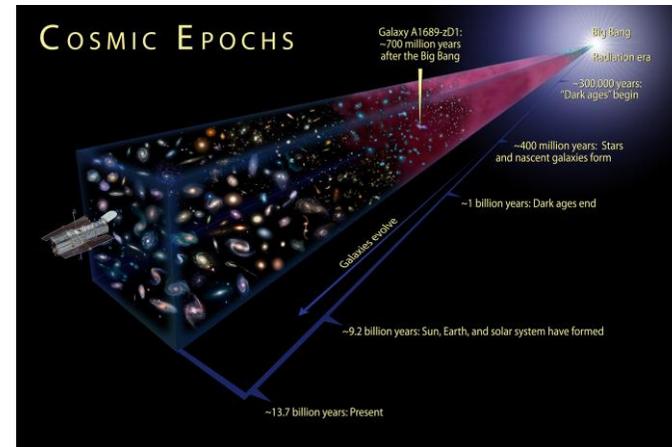
actually expanding, like a balloon. This large, infinite space came from a very small point. Now what scientists have found out by studying the space pictures in 1989, was that the energy pattern of the (cosmic) background is already organized, not random, from the very beginning. This has led to a lot of speculations, and to questions like "why is it organized?" and "why is it not random?" Some astrophysicists are now arguing that even before the coming about of physical matter there already was order... Imagine the vastness of the Milky Way galaxy (of which we, or our solar system, is a part). It is over 100 B stars. The universe itself is more than 100 T galaxies. It is an amazing world of galaxies upon galaxies, yet all those stars that we see, those trillions upon trillions of stars, is only 4% of the universe. This created huge debates and a lot of excitement among scientists... realizing that only a small part of the universe is physically measurable; **96% is invisible.**



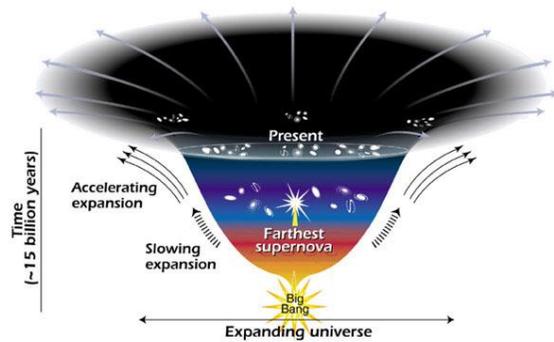
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18. How do we know that these concepts are real? Similar to the study of other planets, scientists study the motion of the planets, etc., and by the impact being created with their motion, like on the effect on the gravitational field... It is then concluded that something must exist to have caused the impact.... This is how the faraway “planet” Pluto was known. The invisibles in the universe can be seen only mathematically (at first), then later verified.

19. The structure of the universe is not accidental; it has specific form and great order. It is organized into solar systems, galaxies, galactic clusters (small or large), black holes, super novae, etc. Scientists were expecting that since the time of the Big Bang calculated to have happened approximately 5B years ago, the universe would already be slowing down (because of the momentum, loss of energy with expansion and gravitational pull, etc.). What they found out instead was that **the universe is actually still expanding and accelerating!** Thus they were dealing with an enigma or mystery.



<http://www.google.com.ph/imgres?q=expanding+universe&start=171&hl=fil&sa=X&biw=920&bih=606&tbn=isch&prmd=imvnsb&tbnid=TuMIGzJDQ0aWDM:Kimgp4u1=http://www.cakitehas.com/books/suniverse-in-nutshell.html&docid=Nf18z19zXlUKPM&imgurl=http://www.stsci.edu/~jnp/hisweek1/hisweek/history.png&w=2700&h=1780&ei=234gUJW4FciemAXuv4DQCw&zooom=1&iact=rc&du=519&ej=107096551466331784350&page=11&tbnh=119&tbnw=180&ndsp=18&ved=1c429r16s1714334&tx=97&ty=38>



This diagram reveals changes in the rate of expansion since the universe's birth 15 billion years ago. The more shallow the curve, the faster the rate of expansion. The curve changes noticeably about 7.5 billion years ago, when objects in the universe began flying apart at a faster rate. Astronomers theorize that the faster expansion rate is due to a mysterious, dark force that is pushing galaxies apart.

http://www.redorbit.com/education/reference_library/space_1/universe/2574648/inflation/

Scientists also discovered the phenomenon of **dark energy**, with force much greater than the pull of **dark matter**, which is the matter that we know that is there, and which determines shape. The scientists are now in a situation that they are dealing with the invisible but real aspect (which earlier was defined only by a mathematical equation)...

Wikipedia says this: *dark matter is a type of matter hypothesized to account for a large part of the total mass in the universe. Dark matter cannot be seen directly with telescopes; evidently it neither emits nor absorbs light or other electromagnetic radiation at any significant level. Instead, its existence and properties are inferred from its gravitational effects on visible matter, radiation, and the large scale structure of the universe. Dark matter is estimated to constitute 84% of the matter in the universe and 23% of the mass-energy.... In physical cosmology and astronomy, **dark energy** is a hypothetical form*

of energy that permeates all of space and tends to accelerate the expansion of the universe. Dark energy is the most accepted hypothesis to explain observations since the 1990s that indicate that the universe is expanding at an accelerating rate. In the standard model of cosmology, dark energy currently accounts for 73% of the total mass-energy of the universe.

http://en.wikipedia.org/wiki/Dark_matter: http://en.wikipedia.org/wiki/Dark_energy

Dark Matter & Dark Energy

Dark Matter is matter that emits or reflects minimal to no light, but does have a gravitational influence. Evidence for dark matter appears to be present in

- the motion of stars in galaxies.
- the orbits of galaxies in galaxy clusters.
- the temperature of intracluster gas in galaxy clusters.
- the gravitational lensing of distant galaxies.

Some possible types of dark matter include:

- Massive compact halo objects (MACHOS) – These are large objects, like brown dwarfs and Jupiter-sized planets, that exist in the halos of galaxies.
- Weakly interacting massive particles (WIMPS) – These are subatomic particles that have extremely small masses, but exist in great quantities. Neutrinos are an example of a such a particle.

Dark Energy is the term used for a possible unseen influence that may be causing the universal expansion to accelerate. Recent observations of supernovae have produced a value for an acceleration that implies a universe that is about 70% dark energy.

http://www.google.com.ph/imgres?q=dark+matter+dark+energy&hl=fr&sa=X&biw=930&bih=606&thm=isch&prmd=imvns&chmid=01vvtowntTh2M:&imgrefurl=http://astro.unl.edu/classaction/outlines/cosmology/dark_matter_energy.html&docid=lcWzY-HZTR61oM&imgurl=http://astro.unl.edu/classaction/outlines/cosmology/dark_matter_energy.png&w=720&h=540&ei=H11cU0T1DuHmAXivYD1BA&zoom=1&inct=he&sys=633&vps=2075&dur=1812&hovh=194&hovw=290&tx=83&ty=104&sjce=107099551406351784350&page=1&tbnh=132&tbnw=175&start=0&ndsp=1&wd=11429&rl4=0&rl3=113

- Another interesting concept and now a proven phenomenon is the **Black Hole**...a common notion of it is that it is something where things can be swallowed up. In Astrophysics terms, it has been theorized as a collapsed star (one that is at the end of its life; the stage when the star explodes). Therein is super gravity and light cannot escape. Now (and again), or about 18 months ago scientists finally captured a

picture of a black hole and there they saw a large star being sucked into the black hole; with its brilliance being sucked into the space of emptiness; into where there was no light. Before this time the black hole was just a mathematical construct.... Because of the methodology in astrophysics that was developed in the last 15 to 20 years, these revolutionary concepts are now verified.



http://nasa-satellites.blogspot.com/2011_08_01_archive.html

21. The universe is super precise and fine-tuned. Scientists also found out that there are **only 6 basic laws that determine the structure (shape, size, integrity) of the universe...** In the 60's and 70's it was found that if 3 or even just one out of the 6 constants are/is altered... the universe will not exist... *The fine-tuned Universe is the proposition that the conditions that allow life in the Universe can only occur when certain*

*universal fundamental physical constants lie within a very narrow range, so that **if any of several fundamental constants** were only slightly different, the Universe would be unlikely to be conducive to the establishment and development of matter, astronomical structures, elemental diversity, or life as it is presently understood... Martin Rees formulates the fine-tuning of the Universe in terms of the following six dimensionless constants:*

- 1) $N =$ ratio of the strengths of gravity to that of electromagnetism;
- 2) $Epsilon (e) =$ strength of the force binding nucleons into nuclei;
- 3) $Omega (\omega) =$ relative importance of gravity and expansion energy in the Universe;
- 4) $Lambda (\lambda) =$ cosmological constant;
- 5) $Q =$ ratio of the gravitational energy required to pull a large galaxy apart to the energy equivalent of its mass;
- 6) $D =$ number of spatial dimensions in spacetime.
http://en.wikipedia.org/wiki/Fine-tuned_Universe

22. It may be illustrated this way: what will happen if the gravitational force is altered, like making it just a little bit weaker or stronger? Scientists found out by calculation that if the gravitational force is diminished by only 10^{-59} or by $1/1000+++$ (or with 59 zeroes after the 1 in the denominator), or by a trillionth, of a trillionth of a trillionth of 1% or something like that, the galaxy would not exist; the galactic form cannot be there... the universe would not be there... the galaxy

would collapse or disperse. There would result a super black hole, and we and life and everything physical around us won't be around.

23. **Dark energy's integrity** may be looked at as a similar phenomenon but this time, it is much more fine-tuned, and thus impossible to be simply random... For dark energy the same phenomenon could happen with a deviation of $1/10^{120}$. Thus, we are living in a universe that is highly improbable, impossible (in the point of view of the astrophysicists). Yet, it exists.

The battle in emerging science: God, plain intelligence, or random events?

24. Now, on the above basis or of the universe's uniqueness and integrity, there are 2 beliefs, propositions or hypothesis. The first is **materialist hypothesis**, which is about the usual science (materialist science); it **operates based on hypothesis and chance**. On the other hand, this is not what is at work in the new science- the **non-materialist science**.

25. On the perspective of chance, some scientists believe that there are an **infinite number of universes, or a multiverse**. Given this multiverse, it would be possible for a specific universe like ours to come out, with its specific laws (*this is also the position of those who uphold the String Theory*)....

26. The second belief or **non-materialist hypothesis** says that if chance is not at work then there is a super factor that overrides this whole aspect connected with intelligence; there is a **super intelligence**. A Physics journal addressed this: it wrote about **the return of the "God Hypothesis"** which says that there is an intelligent force that fits the best science explanation of all the scientific facts available. About 60%-80 % of scientists supported this hypothesis. *Note that a scientific theory becomes accepted mostly depending on the number of scientists who accept it.*

Here are some examples of how the Anthropic Principle directly affects the livability of our planet:

The unique properties of water. Every known life form depends on water. Thankfully, unlike every other substance known to man, water's solid form (ice) is less dense than its liquid form. This causes ice to float. If ice did not float, our planet would experience runaway freezing. Other important properties of water include its solvency, cohesiveness, adhesiveness and other thermal properties.

Earth's atmosphere. If there were too much of just one of the many gases which make up our atmosphere, our planet would suffer a runaway greenhouse effect. On the other hand, if there were not enough of these gases, life on this planet would be devastated by cosmic radiation.

Earth's reflectivity or "albedo" (the total amount of light reflected off the planet versus the total amount of light absorbed). If Earth's albedo were much greater than it is now, we would experience runaway freezing. If it were much less than it is, we would experience a runaway greenhouse effect.

Earth's magnetic field. If it were much weaker, our planet would be devastated by cosmic radiation. If it were much stronger, we would be devastated by severe electromagnetic storms.

Earth's place in the solar system. If we were much further from the sun, our planet's water would freeze. If we were much closer, it would boil. This is just one of numerous examples of how our privileged place in the solar system allows for life on Earth.

Our solar system's place in the galaxy. Once again, there are numerous examples of this. For instance, if our solar system were too close to the center of our galaxy, or to any of the spiral arms at its edge, or any cluster of stars, for that matter, our planet would be devastated by cosmic radiation.

The color of our sun. If the sun were much redder, on the one hand, or bluer, on the other, photosynthesis would be impeded. Photosynthesis is a natural biochemical process crucial to life on Earth.

... The question for us now is, with so many universal constants and cosmological parameters defining our universe, and with so many possible variables for each one, how did they all just happen to fall within the extremely narrow range of values required for our existence? The general consensus is that we are either here by fortuitous luck against tremendous odds or by the purposeful design of an intelligent Agent... Some proponents of the here-by-chance perspective have sought to level the odds against fortuitous luck by hypothesizing a scenario whereby our universe is just one among many in what has come to be termed a "multiverse." This gives nature many more chances to "get it right," bringing the odds against its success down significantly... Imagine innumerable lifeless universes in which one or more of the necessary variables fail to fall within the specific range of values required for life. The idea is that nature would eventually get it right, and apparently has done so as evidenced by the fact that we exist (or so the argument goes). We are the lucky ones whose universe stumbled upon the right combination of cosmological values. The Anthropic Principle is often cited as empirical grounds for the otherwise mathematically hypothetical multiverse... Intelligent Design theorists hail the Anthropic Principle as further evidence in support of their thesis that life was

engineered by a transcendent Mastermind. Not only do biological systems bear the hallmarks of design (the information content of DNA, specified complexity, irreducible complexity, etc.), but the universe which supports and provides a context for life appears to have been designed as a means to that end.

<http://www.gotquestions.org/anthropic-principle.html>

The anthropic principle that relates to the God hypothesis tackles the question: Why is the universe itself just right for life?... The Anthropic Principle is the Law of Human Existence. It is well known that our existence in this universe depends on numerous cosmological constants and parameters whose numerical values must fall within a very narrow range of values. If even a single variable were off, even slightly, we would not exist. The extreme improbability that so many variables would align so auspiciously in our favor merely by chance has led some scientists and philosophers to propose instead that it was God who providentially engineered the universe to suit our specific needs. This is the Anthropic Principle: that the universe appears to have been fine-tuned for our existence. <http://www.gotquestions.org/anthropic-principle.html#ixzz2OzAYzPOI>

27. Regarding scientific hypothesis and theory: a chosen theory would be one that best accounts for the facts (thus accepted by scientists). But there is a reality in science: **Science is always changing.** We need to rely on scientific method or on fact based claims and not just speculations; on theories or framework which are coupled with empirical basis. Otherwise, something

cannot be accepted as true... facts and theoretical basis must be synchronized. This is a moral order... one cannot limit the welfare of humanity to the sphere of one's own judgment or speculation.

28. So scientists progressed from saying that the material world is nothing but vibration, of energy...to the M-theory (Multiple universe), that says there are 10^{500+} universes existing. Very Few people, however, are buying this theory. Even those who are pro-String Theory are not happy with this... or with the idea that there is no intelligence in the Universe, which is a kind of conclusion reached by the current scientific mind... Scientists cannot accept that there is a super mind that is active in the universe.

Science beyond the 5 senses; In sync universal and human brain

29. We need to talk about scientific history, how science concept changed. Science originally was a methodology, and not meant as an ideology. Here the method is this: out of certain amount of existing or found phenomena, one offers a hypothesis, then embarks a process to verify, then revises the hypothesis and so on... Now **somewhere along the line, some 700 years ago, this changed and now it is based only on what one can measure, hear and see (or based only on the 5 senses)**. But consider something like love... we believe in love and say "I love you". This love we truly feel, right? But

this is not according to our 5 senses. Thus in the current attitude in science this "love" is not supposed to exist (!?). In the older science, there was a distinction between primary and secondary causes, and between objective and subjective realities, which before have been relegated to metaphysics, the science of which has limitation, given the limits of the scientific method itself at that time.

30. If we use this kind or level of science, the following can't exist or is not true: non-locality, connectedness, and a universe that is expanding and is very precise. Nothing is left to chance; all must be empirical (*or must only rely on or derive conclusion from observation or experiment: concepts need to be verifiable or provable by means of observation or experiment*).

31. On the other hand QP is saying that all is connected as a whole, where things are operating based in non-locality. Everything is an integrated whole and is unfolding as a whole. Now if above recent findings are science fiction, then why is it that the Pentagon, or the US Department of Defense, who should not believe it, has, 7 years ago, started a project to build a **Super Computer** (e.g., <http://www.zmescience.com/wp-content/uploads/2011/02/quantum-computer.jpg>). A common computer has software and hardware as we know. With the supercomputer of the US Department of Defense the hardware is the universe. Therefore it has super high speed and unlimited storage. We wonder how this is done. It actually relies on quantum properties of non-locality where the universe coheres as a whole. One

can store information in a **quantum vacuum**. Information therein is available simultaneously throughout the universe and can be accessed at any time. A **quantum computer** is a *computation device that makes direct use of quantum mechanical phenomena, such as superposition and entanglement, to perform operations on data. Quantum computers are different from digital computers based on transistors. Whereas digital computers require data to be encoded into binary digits (bits), quantum computation utilizes quantum properties to represent data and perform operations on these data ...* http://en.wikipedia.org/wiki/Quantum_computer

Others sources: <http://news.bbc.co.uk/1/hi/technology/7085019.stm>
<http://arstechnica.com/science/news/2008/03/quantum-computer-may-be-capable-of-seeing-the-big-picture.ars>

Centre for Quantum Computation

What are Quantum Computers ?

Why quantum computation?

The history of computer technology has involved a sequence of changes from one type of physical realisation to another – from gears to relays to valves to transistors to integrated circuits – and so on. Today's advanced lithographic techniques can create chips with features only a fraction of micron wide. Soon they will yield even smaller parts and inevitably reach a point where logic gates are so small that they are made out of only a handful of atoms.

Every 18 months computer manufacturers double in speed. PASTOR CHAMBERS

On the atomic scale matter obeys the rules of quantum mechanics, which are quite different from the classical rules that determine the properties of conventional logic gates. So if computers are to become smaller in the future, new quantum technology must replace or supplement what we have now. The point is, however, that quantum technology can offer much more than cramming more and more bits onto silicon and multiplying the clock-speed of microprocessors. It can support an entirely new kind of computation with qualitatively new algorithms based on quantum principles.

What are qubits?

From a physical point of view a bit is a physical system which can be prepared in one of the two different states representing the logical values 1 or 0, or yes, false or true, or simply 0 or 1.

Classical Bit: 0 or 1

Quantum Bit: 0 or 1 or $\frac{1}{\sqrt{2}}(0 + 1)$

Quantum bits, called qubits, are implemented using quantum mechanical two state systems; these are not confined to their two basic states but can also exist in superpositions; effectively this means that the qubit is both in state 0 and state 1.

Can we build quantum computers?

As the number of quantum gates in a network increases, we quickly run into some serious practical problems. The more interesting qubits are involved, the harder it tends to be to engineer the interaction that would display the quantum properties. The more components there are, the more likely it is that quantum information will spread outside the quantum computer and be lost into the environment, thus negating the computation. This process is called decoherence. Thus our task is to engineer sub-microscopic systems in which qubits affect each other but not the environment.

What are the most promising technologies?

It is not clear which technology will support quantum computation in future. Today simple quantum logic gates involving two qubits are being realised in laboratories. Current experiments range from trapped ions...

via atoms in an array of potential wells created by a pattern of crossed laser beams...

...to electrons in semiconductors.

The next decade should bring control over several qubits and without any doubt, we shall already begin to benefit from our new way of harnessing nature.

How to build quantum computers?

In principle we know how to build a quantum computer; we start with simple quantum logic gates and connect them up into quantum networks. A quantum logic gate, like a classical gate, is a very simple computing device that performs one discrete quantum operation, usually on two qubits, in a given time. Of course, quantum logic gates differ from their classical counterparts in that they can create, and perform operations, on quantum superpositions.

How powerful are quantum computers?

This quantum computers can perform many different calculations in parallel: a system with N qubits can perform 2^N calculations at once! This has impact on the execution time and memory required in the process of computation and determines the efficiency of algorithms.

For an algorithm to be efficient, the time it takes to execute the algorithm must increase no faster than a polynomial function of the size of the input. Think about the size n of the total number of bits needed to specify the input to the problem – (for example, the number of bits needed to encode the number we want to factorise). If the best algorithm we know for a particular problem has the execution time (measured as a function of the size of the input) bounded by a polynomial then we say that the problem belongs to class P.

Problems outside class P are known as hard problems. Thus we say, for example, that multiplication is in P whereas factoring is not in P. "Hard" in this case does not mean "impossible to solve" or "non-computable." It means that the physical resources needed to factor a large number scale up such that, for all practical purposes, it can be regarded as intractable. However, some quantum algorithms can turn hard mathematical problems into easy ones – factoring being the most striking example so far.

The difficulty of factorization underpins the security of what are currently the most trusted methods of public key encryption, in particular of the RSA (Rivest, Shamir and Adleman) system which is often used to protect electronic bank accounts. Once a quantum factoring machine (a specialised-purpose quantum computer for factoring large numbers) is built, all such cryptographic systems will become insecure.

Potential use of quantum factoring for code-breaking purposes has raised the obvious suggestion of building a quantum computer.

Want to learn more?

Please visit the website www.quantum.cam.ac.uk

UNIVERSITY OF CAMBRIDGE

<http://www.defenseindustrydaily.com/schrodingers-contract-us-explains-quantum-computing-0316/>

32. While this is being developed, there are also advances in other fields, like **neuroscience** (<http://www.youtube.com/user/dorinel2001>), that run parallel to the science behind the super computer. It now has revealed many things that defies what we believe in, like where our thinking actually resides...

33. One amazing scientific development is in brain science. The prevailing belief is that the brain is the seat of memory. But we must realize that the brain itself cannot know. **The brain does not store information therein, but in the quantum field.** Our own memories are stored in the vastness of the universe itself! Check out Holographic brain models- <http://www.intuition.org/txt/pribram.htm>; <http://network.nature.com/groups/bpcc/forum/topics/2263>; <http://www.youtube.com/watch?v=nJ-3m5W4cp4>

34. A few decades ago in psychology there was a major revelation by Carl Jung (“Yung”) who died in the 60’s. Jung and Freud are behaviorists and their revelations are referred to as “Jungian” and “Freudian”, respectively. Freud and Jung were good friends but they eventually split. Behaviorists contend that the human psyche is limited to what we carry around (our brain)... Jung challenged this. He examined 69,000 dreams, travelled around the world and concluded that we are not isolated. **Our psyche is part of a huge reality of the unconscious.** Differences between Freud and Jung may be gleaned from here: <http://www.wisegEEK.org/what-are-the-primary-differences-between-freuds-and-jungs-theories.htm>

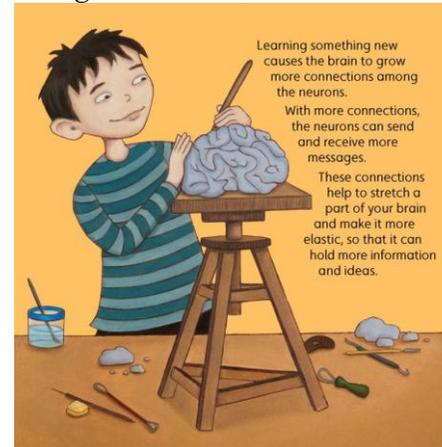
35. On dream. In the dream state we have access to the collective unconscious of humanity today and of the past. If we examine these dreams we will discover archetypes which are aspects of the soul structure and which have big impact on what we believe, see, etc. **The implication of this is that the notion of “isolated psyche” is no longer the mainstream idea.**

36. The US National Institute of Health has a huge interest in Carl Jung, because of this **collective unconscious**. This concept means that we are simultaneously connected to the past and the present content of humanity. This is referred to the **anthropic principle** (which is used for different ideas; it refers to the following ... *In astrophysics and cosmology, the anthropic principle is the philosophical consideration that observations of the physical Universe must be compatible with the conscious life that observes it...* The universe itself is alive and is conscious! And in it we are intimately embedded and interconnected.
<http://www.howstuffworks.com/science-vs-myth/everyday-myths/anthropic-principle.htm>

37. New brain research has discovered that the brain is NOT hardwired... In the beginning of the 21st century **neuroplasticity** was discovered. **Neuroplasticity says that human consciousness can create the structure of the brain.**

38. Case example: Nicky’s brother had a heart attack and got paralyzed. Through mental exercises he eventually

recovered. If we keep on trying, **the brain reorganizes and creates new neural pathways**. This goes along the principle of “use it or lose it”. A practice is capable of making 6 trillion (or 100B) neural connections.



http://www.google.com/publisher/start=07&hl=fi&sa=X&biw=1241&bih=606&thm=isch&prmd=imvnsb&tbid=hcA8Mz3FPxT7xM&imgrefurl=http://www.hardbrains.com/blog/2011/01/21/stretch-and-shape-the-brain-an-introduction-to-neuroplasticity-for-children/&docid=K3wOmn9S4Bw96M&imgref=http://www.hardbrains.com/wp-content/uploads/2011/01/PagesFromYPER_Page1-1024x1024.jpg&w=1024&h=1024&ej=LBasUN2COu60QfovoPQ&zom=1&iact=hc&vpx=122&vpy=282&dur=179&hovh=207&hovw=207&tx=127&ty=99&sig=107096551466351784350&page=5&thb=132&thw=132&ndsp=25&ved=11:129,c:39,s:07,t:50

39. This concept is being applied to athletes. They do mental rehearsals to enhance performance. This is now a common practice. The brain is not able to distinguish between imaginary and actual; it reorganizes either way. In the 2004 Olympics an Australian diver had an injury that did not allow actual practice. She went to the pool daily, imagined her dive, and did this for 3.5 years. She only had a few months of real practice just before the Olympics and ended up garnering the gold medal!

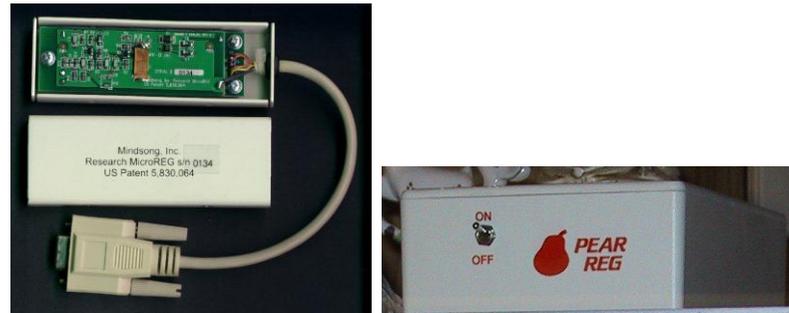
40. **Consciousness can shape matter like the structure of the brain.** In Princeton (Ivy League) University there

is a Global Consciousness Project:

http://www.youtube.com/watch?v=itQMALL_bE&feature=player_embedded;

http://athlyngreen.hubpages.com/hub/Random_Event_Generators_And_Global_Consciousness;

http://www.youtube.com/watch?v=BR02BhPvp7M&feature=player_embedded#) There they discovered that a phenomenon may be altered as demonstrated by a small scale unit or gadget. Certain individuals can affect “quantum decay”. There is this monitor called **Random Event Generator**.



The randomness of phenomena is recorded or generated through this. One day there was a global event (like the “911”). The machine actually picked up the event (randomness was replaced by skewed charts). There were 40 machines located all around the globe and all registered the event. The monitor found the there is an impact of focus of consciousness.



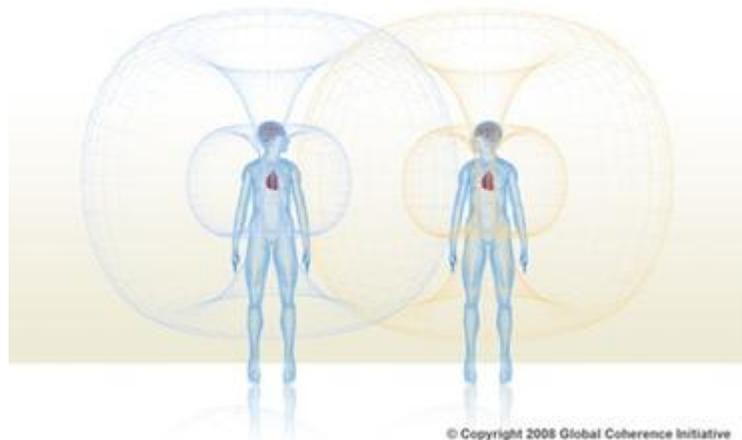
Consciousness Field

How do we jump from the lab results to "global consciousness"? Why should there be any effect of a world-wide New Years celebration, or a billion people watching a funeral ceremony, or the beginning of a war, on such REG devices located around the world? Although it must be recognized as a metaphor, it may be helpful to envision a "consciousness field (*or the collectivity of the group of human souls not currently existing in the Physical Plane, e.g. those asleep, dead or waiting to be reborn.*)". Picture a faint radiance of information extending out indefinitely from each mind, with a wavelike interpenetration creating tenuous interference patterns that differ depending on our intentions and our degree of engagement. Again, we are speaking of a metaphor, not an actual physical energy that we can directly measure, but something like a consciousness field carrying information, which may be responsible for the anomalous effects in "field" studies with REGs. These show consistent deviations of the data from randomness in situations where groups become closely integrated or focused on a compelling mutual interest. During deeply engaging meetings, concerts, rituals, etc., the data tend to have slightly increased order compared with the expected randomness, and we are able to predict this deviation, according to the type of gathering, with significant success.

In the GCP, exactly the same procedure is applied on a broader scale. **We predict a detectable ordering in otherwise random data** during world-scale events that are likely to engage the attention of large numbers of people around the globe. **The prediction is tested by looking for slight, anomalous mean- shifts in either direction**, that is, changes in the variability of the data. The statistics for the continuous data streams registered by the EGG network have well-defined expectations based on theory and calibrations. We simply compare the empirical data with this background to see whether our hypothesis is supported. **Simply put, we predict differences from expectation which are correlated with certain global events.** If there is any effect of global consciousness on our detectors, we look for it to be concentrated during those special times when humanity experiences broadly shared interests, feelings, and reactions.

<http://www.barry.warmkessel.com/Vulcananimals.html>

The heart radiates an electromagnetic field affecting each others' moods, attitudes and feelings - whether we are conscious of it or not.



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41. Consciousness is deeply embedded in matter. There is interconnection between the two.

Tapping the Hidden Power of Humans

42. Another example. There are scientists whose task is to assess and compare the energy of living things and non-living things, to develop criteria of comparison, and to compare the amount of energy emitted per density of matter. They found that **the highest amount of energy being emitted per unit matter is that of the brain of humans.** This is greater than the whole universe itself, or the stars. There's something in our nature that we hardly know. **We can't build society without looking into it** (i.e., the human consciousness, or those which we don't know about our true nature). We need to **discover the future before it happens.**

43. Thomas Edison, considered as the greatest inventor, said something about the basis of his creativity: *I was born with a talent to tap into the infinite intelligence.*

44. On the day when the university was originally conceptualized, the precept was **“man, know thyself”**. This is the foundation of the Greek civilization. Today, however, this is hardly the focus of our education. We have forgotten who we are. There are already

thousands of disciplines, but very few integrated the meaning of these discoveries about who we are.

45. Our consciousness is embedded in the universe itself. So we can know the universe itself; so we can know as the universe unfolds. The implication of this for the academe is that ... **the most important task of the university is to develop a kind of critical thinking about who we really are, what to do when we graduate, what to do in the world.**
46. **Irrelevant education?** We are being molded for a system that is actually collapsing. It is known that there are half-lives in knowledge. The estimate for molecular biology is less than 6 months. For particle physics it is 18 months, and it is 7 years for agriculture. There is now an economic crisis, and this is global. If the global economy survives, we need to see the mechanism, or how it has done so...
47. Using derivatives, calculation had been made to know what would be needed if the whole economic system collapses: the allocated amount is \$300 T. But there is a saying: *a good amount of money on a bad framework won't work.* and another saying: *We can't solve the problem with the same consciousness which created the problem.* The real solution needs to be outside that framework.

New Science, New Framework; Know Thy Self to Create a New World

48. **We need to create a new world with these scientific findings...** to do this we need to, and can access, the future. Creativity is the ability to sense the future that is emerging. If we are able to tap into the future, then we have the power to transform.
49. The consequences of our action are on a planetary scale. Some estimate that something of that scale will come within 7 years. For example, in year 2015, Metro Manila will have changed, due to arctic ice melting. So we are at a dead-end because of our 20th century thinking. But we are gifted with a capacity. Education can awaken this, or we can take it upon ourselves to realize who we really are. And we can actualize highly creative solutions.
50. The Philippines has its own challenges, i.e., the epochal 2010 (Election). My framework in the campaign was: **we can only constructively engage in change if we are grounded on a new science.** This needs understanding of “who we are” and “what the nature of the world is”.
51. The cosmology of the present age is that we are simply... nothing... When the sun is gone, then we are also gone. **But we have stupendous power within ourselves, to contribute to the world.**

Further Inputs from Nick through the Q&A and Sharing session

52. *Dr Barril: Your talk reinforced my belief on God... His omnipotence, omnipresence, etc. are about non-locality... If only we realize that we are made to His image, we can do so much- there is unlimited possibilities... We are also part and parcel of the whole... There is really a super-Intelligence- God. Here, improbabilities are made real... and the planet earth is made to be very special...* Nick: There's a massive dialogue going on today between science and spirituality, and this was not possible before. One of the biggest things that had been discovered and this one may also find in the internet - the **Templeton Foundation** which is dedicated to this dialogue as it feels it is essential for humanity- is that Science of spirit is not antagonistic to material science, but is now providing a spiritual ground... It is essential to take a look at some of the spiritual findings for the last thousand years and ground it on empirical basis. This is important for today's level of consciousness.

http://en.wikipedia.org/wiki/John_Templeton_Foundation;
<http://www.templeton.org/>

53. What be your quick answer on this... *what is gravity? What is the source of gravity?*

54. I have another way of defining gravity; your question can have a very complicated answer. For now here is my answer

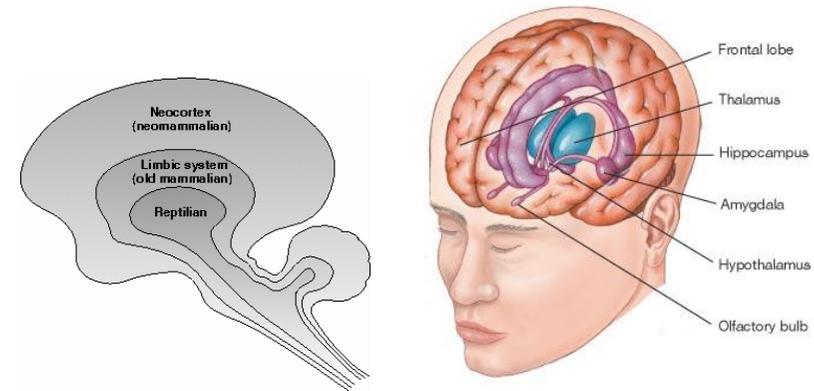
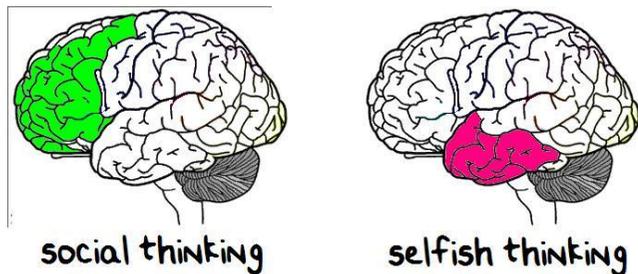
Gravity is a manifestation of many concepts (according to a book I was reading and which is downloadable...) ... there is a quantum vacuum and it relates to how particles are created. The mass for gravity is actually a temporary manifestation of converging of energy...

Scientific fields can be viewed at the narrow or deeper level... doing the latter makes us see the wider framework... The mainstream molecular biology, which is hot in this campus, is trying to frame its scientific hypothesis on a certain theory of physics which other physicists have already abandoned; they already proved untrue on greater scale. There are now all kinds of unprecedented effects emerging in genetic engineering ... In the new framework (which includes concepts beyond matter or the readily observable physical) matter as we know it, or which is according to our conventional conception of it, has already "disappeared".... There are so many anomalies in the current science. And note that when a theory has already a lot of anomaly signals a start to rethink the foundations of the framework in which that science hinges.

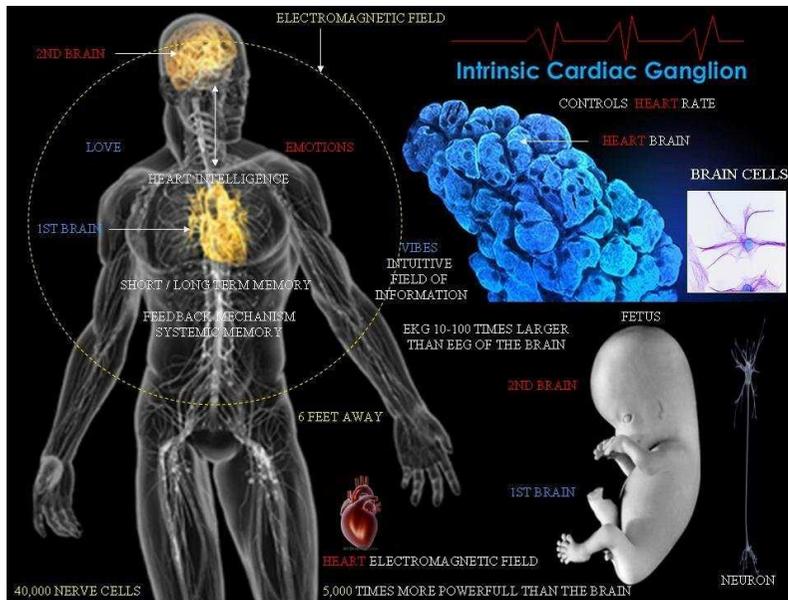
... Scientists have also begun talking about anti-gravity and the dark energy that has been discovered by astrophysics to have anti-gravitational properties. This has major implication, because it totally de-conceptualized mainstream science.

55. If we follow closely the scientific advances, we will conclude that all the things that we have been taught in the university is old. We need to find out what is still viable or what is still relevant of the past... For example, I realized during my formal studies that the theory of relativity had transcended Newton's but included his equation. In advanced physics in high school we recall that we can derive the Newtonian equation from that of Einstein's Theory of Relativity. In the same way, the latter may also be derivable from that of quantum physics. So the nature of or key in a scientific revolution is that it can put the context of a certain reality in a broader framework...
56. Another statistics regarding the half-life of science... half-life is the time that half of the knowledge after you graduated from PhD becomes obsolete. The half-life of molecular biology is 6 months, as estimated in 1990's. That of medicine is 2 years; of particle physics is one year. That of agriculture is 5-7 years. Yet what era do the concepts that we are teaching students these days belong to?
57. We should not think of the university as the finishing, but the beginning of education. Education is about questioning of truth and knowledge. The ordinary people would think of one with this attitude or who is in this journey as weird and crazy. Thus it is important to have a good scientific grounding. Check out in the internet for CTR or the Center for Theory and Research. Therein are institutions which are into the new movement. For example, in The Integral Institute, and the Integral Research Center in JFK University, there is dialogue between and integration of science and spirituality. I would not throw away conventional science but I would see it as part of a scientific journey... to answer some of the deepest questions.
58. Tapping creativity, unleashing human potential. There is a technique to tap the infinite intelligence. There is creativity that's in us to access this intelligence. It comes as an "AHA" moment. It is not a random event. Check out www.heartmath.org. There resides one of the most fascinating approach to creativity. The nature of heartmath is that you can enter at will to reach creativity. http://www.lilipoh.com/past_issues/2009Issues/Spring2009/HeartMath.aspx
59. The heart has neural system which is as much as, or even more complex than, the brain. If we can harmonize the two (note: there is also a gut brain). Heart intelligence does not refer to emotion. It is about being able to move into a larger state of reality.
60. Our head brain has different parts. The reptilian brain is the most ancient and it is the one that is predominant in congress (based on what brain is being used there)... *The amygdala and reptilian brain do not strategically look at things*. Check this out for more on the head brain- <http://www.whatonearthishappening.com/component/content/article?id=65:the> Research in neurosciences demonstrates that although the 3 brains communicate with each other, each one has a **specialized function**: The "**New Brain**" thinks. It processes rational data and shares its deductions with the other two brains. The "**Middle Brain**" feels. It processes emotions

and gut feelings and also share its findings with the other two brains. The **“Reptilian Brain”** decides. It takes input from the other 2 brains but it controls the final decision making process. Once you know that **the true decision-maker is the Reptilian Brain**, your entire sales and marketing strategy should apply completely different communication principles in order to be impactful. <http://www.salesbrain.com/why-do-you-need-a-neuromap/neuromap-overview/the-3-brains/>



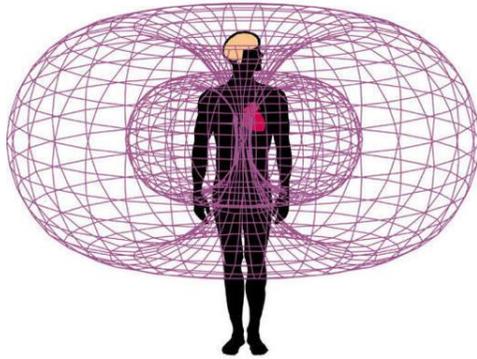
61. The heart has neural connections and considered to be a brain, called the heart brain. It has more holistic capacity.
62. The heart is the center of appreciative intelligence, the capacity or power to see the tree in the seed or an acorn. The heart also has the same resonance (or EM frequency) as that of the earth and the sun. There is that interconnection.



http://www.disclose.tv/action/viewphoto/31248/The_Heart_Brain_and_Head_Brain_of_Mind/

The heart cells are unique in that they produce strong electromagnetic signals extending as far as twelve to fifteen feet from the body in the shape of a torus. The heart acts as an axis to this torus. (See Figure.) “This torus function is apparently holographic, meaning that any point within the torus contains the information of the whole field” (Pearce, 2002, p. 58). The torus is our connection to the eternal realm. In fact, the earth, the solar system, the galaxy and perhaps even the universe is formed in the shape of a torus. “Some scientists conjecture that all energy systems from the atomic to the universal level are toroid in form. This leads to the possibility that there is only one universal torus

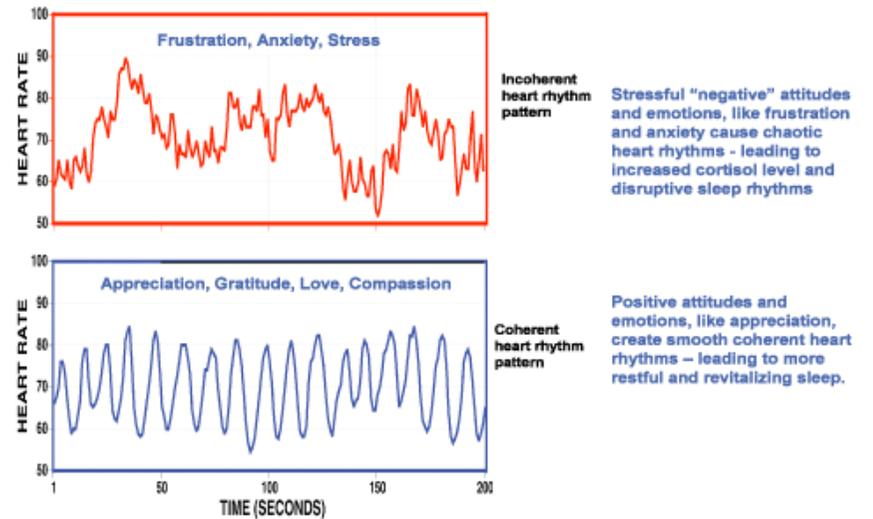
encompassing an infinite number of interacting, holographic tori within its spectrum” (p. 59). The universal torus encompasses the solar system which encompasses the earth which encompasses the human (mind and heart).



Copyright © Institute of HeartMath Research Center

<http://www.drbren.com/2012/01/01/soul-is-a-torus-a-toroid-field/>

63. **The task for us is to find a state of brain-heart coherence.** The heart is able to reset the heart brain intelligence through some breathing exercises. One is through **“Freeze-frame”**.



Copyright 2009 Institute of HeartMath

<http://menalive.com/tag/institute-of-heartmath/>

64. **“Freeze-frame”** is in 5 steps, and it achieves heart-brain coherence which then brings one to a state of creativity. If you can reach that you can be attuned to the creative process...

The five-step process of Freeze-Frame includes the following:

1. Recognizing a stressful feeling and freeze-framing it by taking time out.
2. Shifting your focus of thinking away from the disturbed emotion and into the heart area.

3. Recalling a fun time or a positive feeling you've had in the past and giving your heart energy to it for at least ten seconds.

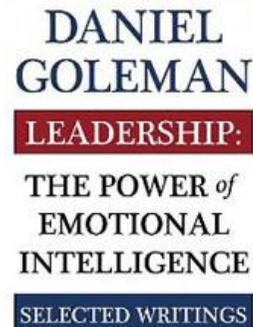
4. Asking your heart what would be a more efficient response to the stressful situation you've put in freeze-frame.

5. Letting your heart give you the answer and following what it says.

<http://www.intuitive-connections.net/2004/book-intelligentheart.htm>

65. For heart management, some people carry “biofeedback” gadgets in their pockets. It can tell them if they have achieved heart-brain coherence. Check out: <http://www.anxiousorg.com/gadgets.html>. Direct feedback is given so we can achieve state of coherence at will.

66. There are now at least 11 intelligences defined. However, the university trains only the IQ (logical-mathematical and linguistic intelligence)... UPLB trains us on these. Unfortunately, if we have low EQ we will fail in life. Read the book of Daniel Goleman.



<http://www.businessballs.com/eq.htm>
<http://www.eiconsortium.org/>

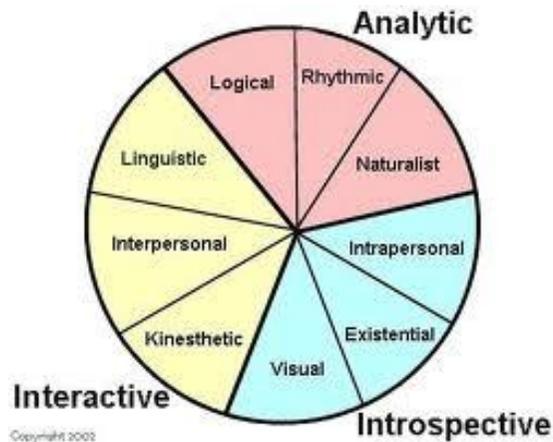
The Five Components of Emotional Intelligence at Work

| | Definition | Hallmarks |
|-----------------|---|--|
| Self-Awareness | the ability to recognize and understand your moods, emotions, and drives, as well as their effect on others | self-confidence realistic self-assessment self-deprecating sense of humor |
| Self-Regulation | the ability to control or redirect disruptive impulses and moods the propensity to suspend judgment—to think before acting | trustworthiness and integrity comfort with ambiguity openness to change |
| Motivation | a passion to work for reasons that go beyond money or status a propensity to pursue goals with energy and persistence | strong drive to achieve optimism, even in the face of failure organizational commitment |
| Empathy | the ability to understand the emotional makeup of other people skill in treating people according to their emotional reactions | expertise in building and retaining talent cross-cultural sensitivity service to clients and customers |
| Social Skill | proficiency in managing relationships and building networks an ability to find common ground and build rapport | effectiveness in leading change persuasiveness expertise in building and leading teams |

<http://hbr.org/2004/01/what-makes-a-leader/ar/1>

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67. Many kids with high IQ, when they reach age 28 (at the end of the 4th 7 years of life), are already considered to have failed in life. They become “nerds”. Kids with both high IQ and high EQ, on the other hand, are called “geeks” (like the FB founders).

68. One out of 11 intelligence is “**existential**” intelligence”, that which relates to having a sense of purpose on earth. Unfortunately none is being offered in a mainstream curriculum although it is a fascinating subject. Actually this is a fundamental question among college students: “who am I really?” Students need to know or have a clear meaning in life. This will give them stamina and perseverance.



*The term Multiple intelligences, was first developed by Harvard professor **Howard Gardner**, to describe the portfolio of different kinds of human “intelligences” we all possess... Garner suggests that each individual manifests varying levels of these different intelligences – giving each of us a unique “talent profile.”... Gardner first identified seven core intelligences: • linguistic • logical-mathematical • spatial, • bodily-kinesthetic, • musical • interpersonal • intrapersonal. Later, he added an eighth: • naturalistic intelligence. And the possibility of a 9th: • existential intelligence. Now other researchers are piling on other variations and possibilities including: • emotional intelligence [EQ] and • transformational intelligence.*
<http://www.cementor.com/2012/06/16/use-all-9-11-intelligences/>

69. If UPLB becomes the center of MI, or if only it is the center of multiple intelligence, if only it is honored and recognized for this, **UPLB can truly help transform this country.**

New Renaissance...

70. New Renaissance is not cliché or an empty statement because history tells us that the modern world we are living now has been created by the Renaissance movement in Italy. This was a holistic revolution involving arts, science, humanities, social sciences, etc. We are actually a by-product of that renaissance movement. (*Renaissance was a cultural movement that spanned the period roughly from the 14th to the 17th century, beginning in Italy in the Late Middle Ages and later spreading to the rest of Europe.*)

71. Today we are on a threshold of a new renaissance. It is not only planetary but also cosmological. We have now a deeper understanding of how...ic. If the universe honors a full human being and one who is truly educated. Remember the meaning of the word education... **“educare”... this means** to “draw out” the human potential...

72. Thus, IQ does not spell success. Education can be an exciting journey (should be, for everyone). It is not and should not be only about just taking exams and having outstanding teachers and students.

73. Art has a central role in holistic education. It functions to balance and let flow the creativity of students... I was amazed to know that there are prototype initiatives along this line here in UPLB... I think there is great power in this university considering that it is a bastion of science. Hope that the academic community harnesses this power, capitalizing on its position in the world. ... A prototype initiative can lead to bigger and a lot of other possibilities. At this point the community is opening up to the public. So there are openings but we also need to self-reflect on our deficiencies; need to address certain things, especially those that we are addicted to (*ego feeding? competitive mode? materialist focus? complacency?*)

74. I am familiar with TED Talks, which features a lot of science lectures. Maybe this can also be done here... The science community should be aggressive in promoting the new science in the context of the Philippines...

*TED is a nonprofit devoted to Ideas Worth Spreading. It started out (in 1984) as a conference bringing together people from three worlds: **Technology, Entertainment, Design.***

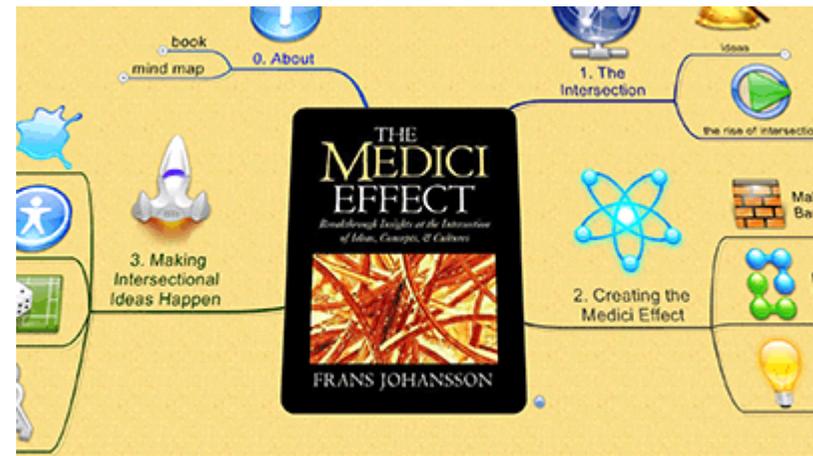


75. One of the values of art (I know of someone with science training who did not appreciate it until later in life) is that it activates all the other intelligences including IQ because art has the property of integration. There is a thick book about art and physics. The key features give examples after examples of blending science and art ... By the way, did you know that **art discovered scientific theories 200 years in advance?**

76. There is a book called “The Medici Effect: Breakthrough Insights at the Intersection of Ideas, Concepts, and Cultures” which can illustrate an approach for transformation through societal creativity. The Medici effect is named after the patrons of the renaissance... By the way do not emulate the approach; it was a violent kind of revolution.

77. **One of the key principles of creativity is the coming together of the different sectors and having a dialogue.** “Breakthrough Insights at the Intersection of Ideas, Concepts, and Cultures” says this: *Why do so many world-changing insights come from people with little or no related experience? Charles Darwin was a geologist when he proposed the theory of evolution. And it was an astronomer who finally explained what happened to the dinosaurs. Frans Johansson’s The Medici Effect shows how **breakthrough ideas most often occur when we bring concepts from one field into a new, unfamiliar territory, and offers examples how we can turn the***

ideas we discover into path-breaking innovations.



Mind map of the book. <http://www.amazon.com/The-Medici-Effect-Breakthrough-Intersection/dp/1591391865>

78. In The Medici Effect, author Frans Johansson explores one simple yet profound insight about innovation: in the **intersection of different fields, disciplines and cultures, there’s an abundance of extraordinary new ideas to be explored** <http://litemind.com/medici-effect/>. Video interview:

http://www.youtube.com/watch?v=ocWmWjTk1FI&feature=player_embedded# Video

introduction http://www.youtube.com/watch?v=ms3ZIS2jX_4&feature=related

79. The Medici book talks about societal creativity. The patrons of the Renaissance remained in France... and orchestrated (or created the field of) societal change). Watch: <http://www.youtube.com/watch?v=AsrRqsSM97U&feature=related>. Art and engagement of different sectors/realms allow creativity (ideas and implementation) to come together.

Human creativity working with Nature's art

80. In a part of Zambia people build houses like that of termites. Thus, they have “no aircon” in the buildings. This is an example of learning from and copying nature. Biomimicry is at work here.



<http://biomimicryinstitute.org/case-studies/case-studies/termite-inspired-air-conditioning.html>

81. The UPLB Chancellor can create a TED type lectures (<http://www.ted.com/talk>). You could have a Ted conversation in the academe – engage key people in it (e.g., the Chancellor himself and others). You have a concentration of PhD's so this should be not difficult to have. But make it attractive; refresh already existing approaches.
82. Did you know that “Techne” in Greek actually means art, or the process of creativity? Art is a process of creation.
83. Global trends emerge at the same time in different places. There are several global phenomena being predicted... like that vision for 2012 (galactic alignment, cataclysms, end of dark ages, etc). There are a lot in the web one can research on about this phenomenon... A few months ago, John Anderson of Arlington Institute (his ideas are one of the most thoughtful, futuristic) predicted US financial crisis... He actually was consulted by the CIA and others because of this foresight... Anderson goes beyond economics.
84. And in 2012 a number of global trends converging together are being predicted. The global climate change is one. There is the possibility of global economic crisis which will not be solved, and the world economy will really collapse.

85. Read Roubini's book: *Renowned economist Nouriel Roubini electrified the financial community by predicting the current crisis before others in his field saw it coming. This myth-shattering book reveals the methods he used to foretell the current crisis and shows how those methods can help us make sense of the present and prepare for the future. Using an unconventional blend of historical analysis with masterful knowledge of global economics, Nouriel Roubini and Stephen Mihm, a journalist and professor of economic history, present a vital and timeless book that proves calamities to be not only predictable but also preventable and, with the right medicine, curable.*
<http://www.amazon.com/Crisis-Economics-Course-Future-Finance/dp/014311963X>

Nouriel Roubini and Nassim Taleb ("Dr Doom" and the "Black Swan") discuss the crisis --and what to do about it. Watch this video:
<http://www.youtube.com/watch?v=hk4TgUxX0fQ>

86. There are converging global and cosmic events. ... In Dec 23, 2012 the sun will pass through a galactic center of gravity... some global phenomena are expected . It is also predicted that peak oil will run out. Japan is predicted to experience major calamities. There will be spillover in events after 2012.
http://www.youtube.com/watch?feature=player_embedded&v=hNpWT9ozI3U#!

87. Now there are science-based and society approaches to deal with massive systems (planetary and beyond). One approach is **Theory U** (at MIT) or **Presencing**. It is a powerful synthesis of 15 disciplines.
<http://mitsloan.mit.edu/newsroom/newsbriefs-0605-scharmer.php>

<http://www.youtube.com/watch?v=71UyGBBcdJY>

88. How can we effect **systemic change**? Nick: Remember that here the mind set is important. And this is the blind spot of leadership. We need to be in touch with the "new form" before it emerges. We need to have that vision.

89. We are thankfully waking up... and realizing that we are at the edge. **We are on the 6th stage of our species and earth evolution.** We are doomed for extinction, included are the humans. This extinction is human made; we chose so out of the gift of free will. At this point, we need to do something revolutionary. We need to place ourselves, as free human being, correctly. (for some introduction:
http://www.anthroposophy.org.au/index.php?option=com_content&view=article&id=47%3Aan..&showall=1)

90. If we think and say that "I am too small"... When we think that we are too small to effect big change, we are underestimating ourselves and let create that reality; it becomes a self-fulfilling prophesy. Thinking so we become **part of the forces of destruction**. We need to ask each one of us to make a decision. To destroy or to create?

91. **Collective Intelligence** has been discovered 10 years ago. It further assures us that change is not impossible when a critical number of conscious and committed people is reached... *Collective Intelligence vs Groupthink. MIT's Center for Collective*

*Intelligence defines Collective Intelligence (CI) broadly as “groups of individuals doing things collectively that seem intelligent.” This differs from **groupthink** (i.e. voting along party lines, investors getting caught up in speculative bubbles) because the individuals following groupthink are not making decisions based on personal knowledge and research, but instead on others’ actions and rhetoric.* <http://swarmonomics.wordpress.com/2009/05/15/collective-intelligence-v-groupthink/>

'Groupthink' it seems to encompass some aspects of social interaction that societies have adopted to reduce conflict. For example, the benign social niceties that require us to say please and thank you, but unfortunately, group think is a continuum and the other end of the spectrum manifests itself as such thing as deference towards superiors, social paralysis affecting specific groups of individuals, for example 19 Century England and the social class system. Clearly in the fast moving and changing society that we live in now, these ways of working act as a barrier to moving forward. <http://collectiveintelligencespectrum.blogspot.com/2010/01/collective-intelligence-versus.html>

92. If there is real listening and dialogue in a group then it is possible to enter into a special state of existence in a group, where Collective Intelligence emerges. This is called **“generative dialogue.”**

Generative dialogue

Generative dialogue creates something new. It’s a commitment to bring out the best in others with authentic conversations. Generative dialogue is appreciative

and calls forth a new future through the flow of meaning in relationship. When we engage in generative dialogue, we lean towards a possible instead of a predictable future.

If the three conditions of Energy for dialogue, Safety and Possibility are evident, at least five generative actions take place:

1. Committed listening
2. Respecting one another
3. Suspending judgment
4. Coming out with an authentic voice
5. A collective search for truth

What are some advantages of creating a space for generative dialogue?

- Conversations that never would have taken place are now part of the organizational culture
- You are having more open and authentic conversations with your staff and it is being appreciated and noticed
- Undiscussables are being surfaced and dealt with in a professional manner
- You are getting better results when having performance reviews and communicating change
- You are more confident having tough conversations with less stress and more success
- You experience better productivity and morale is improving
- Professional and personal relationships are enhanced
- Political posturing, issues and power games decrease
- Rework and errors decrease

<http://www.authenticdialogue.com/?p=3564>

93. Stages:

- (1) Superficial stage
- (2) Debate

- (3) Active listening (what others believe, etc.).
Connect to the sense of the world... at a higher level
- (4) Emergent dialogue to reach Collective Intelligence in/of the world.

94. There are many other ideas on how to go about change... Adam Kahane wrote his ideas that include a new approach, proven in the field, for making progress on our most important and difficult collective challenges ... He shares how to negotiate some of the toughest challenges facing both local communities and society at large. **Adam Kahane - Power and Love: A theory and practice of social change...** Power he defines as “the drive of everything living to realize itself.” So power in this sense is the drive to achieve one’s purpose, to get one’s job done, to grow. He defines love as “the drive towards the unity of the separated.” So love in this sense is the drive to reconnect and and make whole that which has become or appears fragmented. <http://www.youtube.com/watch?v=v8ScJqk25yo;>
http://www.youthsi.org/uploads/5/4/8/4/5484087/u-process_-_social_technology_for_highly_complex_challenges.pdf

95. We need to ... “change, or die”!

96. Health care in the US is \$ 3 T. All solutions to health are already known. Here in the Philippine 40% of Filipino have HIV. If we don’t change our approach then things can get worse.

97. **What we did NOT DO in the previous mass movements... 3 things found:**

- 1 Relate** - find the other who is also searching. Do dialogue and therein something emerges.
- 2 Repeat** – by the principle of neuroplasticity. In 3 weeks we alter a habit. It will have a life of itself.
- 3 Reframe** – deeper strategy is understood in the context of social environment.

98. **You change when you take initiative.** Need to breakdown your own discipline or one’s role therein. Be ready to dissolve the old.

99. In 2010 – the country is predicted to plunge, if we don’t change. **Cultural revolution** is what we need, if we want to have a new world. We are now in a national black hole.

100. The Thais, as we know, have political will. How do we develop our people’s political will, through the new science, to enhance the cultural revolution?



END